

**A new cavernicole species of the genus *Anelpistina*
(Insecta: Zygentoma: Nicoletiidae) from the Guánica
subtropical dry forest, Puerto Rico**

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Abstract.—A new species of genus *Anelpistina* (Insecta: Zygentoma: Nicoletiidae) from the Antillean island of Puerto Rico is described here. This is the first species of this genus to be described outside Continental America.

The sub-tropical dry forest reserve of Guánica, Puerto Rico, contains 4050 hectares of one of the best-preserved dry subtropical forests in the world and is also host to some of the island's greatest diversity of species (Wiley 1985). Since the arrival of European colonists in the 16th century, 90% of the island has been deforested, and almost all remaining forests are intensely disturbed. Puerto Rico's original forests now remain largely in Guánica and in the Luquillo Experimental Forest (Wiley 1985). In 1981, UNESCO declared the Guánica forest to be a biosphere reserve.

Guánica forest caves, from the middle Tertiary Ponce limestone (Peck 1981), harbor several uniquely adapted cave organisms (troglobites). La Cueva de los Murciélagos de Guánica (The Bat Cave), a cave with several sink and collapse entrances and a large section floored by a brackish lake containing vast quantities of liquefied guano, is home to several such species including three crustaceans, *Stygiomysis holthuisi*, *Metaniphargus bousfieldi*, and *Thyphlatya monae*. Another troglobite recorded from this cave is a thysanura insect of the family Nicoletiidae, which P. Wygodzinsky determined to be from the genus *Cubacubana* (Peck 1981).

In 1974, a single male thysanura of the genus *Anelpistina* (Insecta: Zygentoma: Ni-

coletiidae) was collected from Cueva Murciélagos by Dr. S. Peck and subsequently deposited in the American Museum of Natural History in New York, U.S.A. Acknowledging the expertise of P. Wygodzinsky on this group, we can probably exclude the possibility that this is the specimen studied by him as he would not have confused this specimen, clearly an *Anelpistina*, as belonging to the genus *Cubacubana*. Therefore, this cave locality most likely hosts two cave-adapted Nicoletiid species, the new *Anelpistina* species described here, and an undescribed *Cubacubana* species. Espinasa (2000) described a cave in Mexico in which two species of these genera co-exist but with niche differentiation: *Anelpistina* in the surface and penumbra zone and *Cubacubana* in the dark zone. The situation appears to be different in Guánica. Since the new *Anelpistina* species of Guánica appears to be cave-adapted based on its long body and length of appendages, we assume that it inhabits the dark zone.

Materials and Methods

A single individual was in a vial with ethanol in the collection of the American Museum of Natural History. Dissections were made with the aid of a stereomicroscope. All illustrations were made with the

aid of a camera lucida attached to a compound microscope.

Type was deposited in the American Museum of Natural History.

Anelpistina puertoricensis, new species

Figs. 1A–E, 2A–D, 3A–F

Type material.—Puerto Rico, Guánica State Forest, La Cueva de los Murciélagos de Guánica (the bat cave), about 9 km E of Guánica. 12–14 Jun 1974. Stewart B. Peck & J. Peck colls. Male holotype. Personal contact with S. B. Peck corroborated the collection locality.

Description.—Body length 13 mm. Antennae and caudal appendages broken. Maximum conserved length of antennae 10 mm and of caudal appendages 2 mm. Body proportions as in Fig. 1A. General color light yellow to white.

Antennae as shown in Fig. 1B–C. Basal article without projections. Pedicellus two thirds as long as the basal article, with unicellular glands on the ventral surface with a row of microchaetae bordering them in the form of a “U”. The glands cluster into three groups, one very long and partially subdivided (Fig. 1B). Head with abundant and long macrochaetae, as shown in Fig. 1C, with approximately 8 + 8 macrochaetae on border of insertion of antennae. Microchaetae less abundant on back of the head.

Mouthpart appendages relatively long, maxilla as shown in Fig. 1D. Last articles of maxillary palp missing in individual. Apex of maxillary palp with two conules of similar width. Mandibles long, without very small pegs on bigger tooth and chaetotaxy as in Fig. 1E. Labial palp as in Fig. 2A, apical article barely longer than wide and barely longer than the next to last article. Penultimate article with bulge containing two macrochaetae. Labium and first article of the labial palp with macrochaetae.

Mesonotum with approximately 5 macrochaetae on lateral borders apart from several setae of varied sizes (Fig. 2D). Legs as

shown in Fig. 2B–C. Hind tibia approximately 5× longer than wide and slightly shorter than tarsus. Inner face of trochanter with a projection like a talon (Fig. 2C). Trochanter in first and second legs normal. Claws of normal size.

Abdominal terga and sterna as in other members of genus. Abdominal sterna II–VII subdivided into coxites and sternite. Sterna VIII and IX of male entire. Appendages of urosternum IV relatively short, attaining slightly above 1/2 the length of stylets, and approximately 3× longer than wide (Fig. 3A). Outer border with a row of pegs (Fig. 3A–B). Apex of appendages with a small hook (Fig. 3B). Urosternum VIII of male long and shallowly emarginate on posterior margin, posterior projections slightly acute (Fig. 3C). Urosternum IX without a row of sensory cones, highly sclerotized submedian longitudinal macrochaetae, or a small group of short distinct setae behind insertion of parameres in center. Inner projection of insertion of stylets enlarged and protruding (Fig. 3C). Protuberance of internal face of coxal processes with spiniform macrochaetae highly sclerotized (Fig. 3C–D). Point of insertion of parameres in urosternum IX deep. Stylets II–VIII as usual for subfamily. Stylets IX larger than others, with 2 macrochaetae and an extra subapical pair, but otherwise without pegs or modifications (Fig. 3C). Terminal spine with small teeth. Urotergite X shallowly emarginate, posterior angles with several macrochaetae and a few relatively strong setae. Length of inner macrochaetae slightly longer than distance between them (Fig. 3E).

Penis and parameres as shown in Fig. 3C–D. Parameres attain slightly below 1/2 the length of stylets IX in adults. Surface of parameres with short setae.

Cerci of adult male with a wider than long basal article, then a very long one bearing numerous spines. Spines consist of a very small one, a strong, subacute one inserted in a tubercle, another very small one and a long, acute and slightly curved

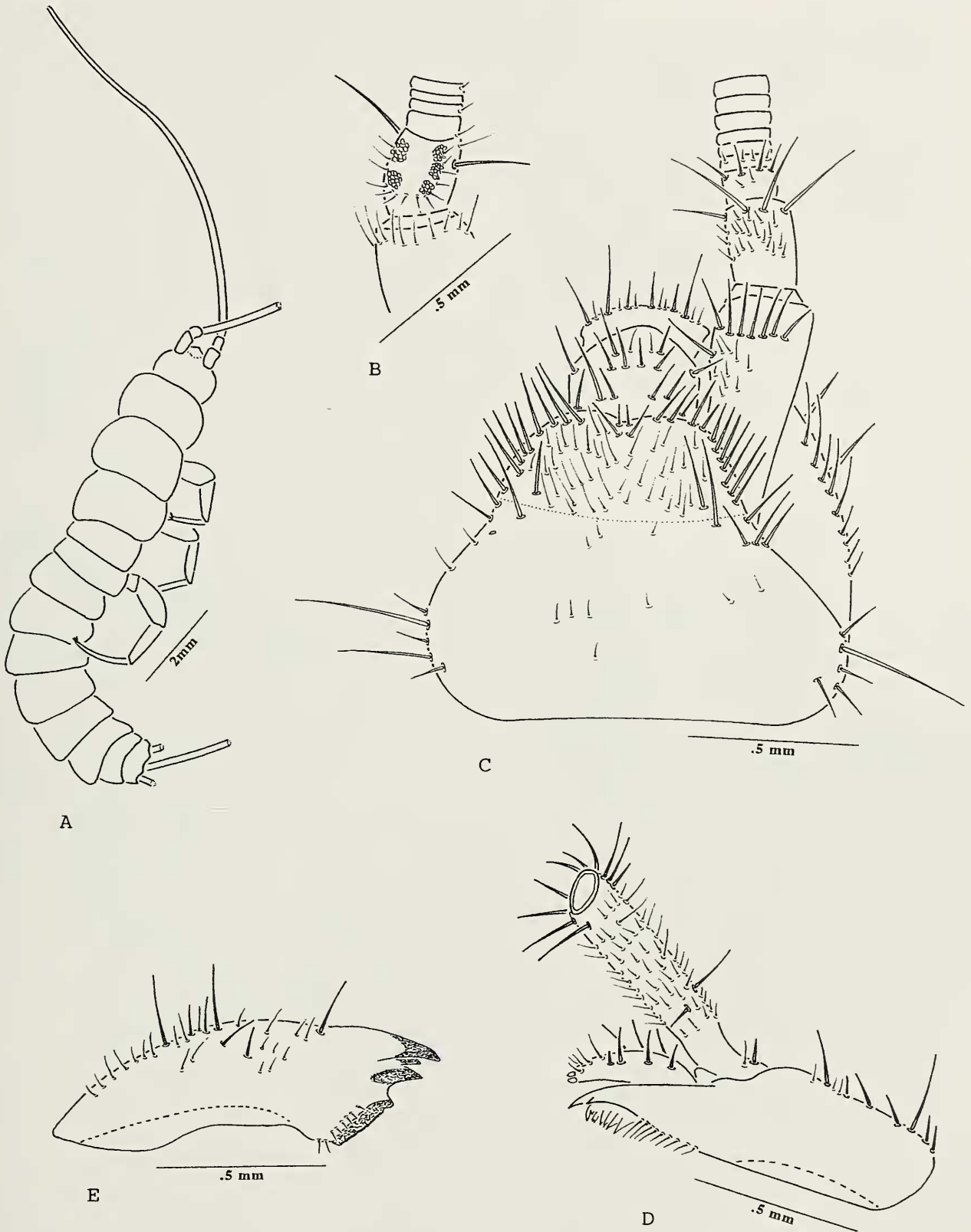


Fig. 1. *Anelpistina puertoricensis*, n. sp.: Adult male holotype; A, Body; B, Pedicellus; C, Head and basal portion of antenna; D, Maxilla; E, Mandible.

one also inserted in a tubercle. Below this group several long and highly sclerotized macrochaetae inserted in tubercles (Fig. 3F).

Females unknown. Postembryonic devel-

opment unknown because only a single male examined. It is assumed that this individual is an adult based on its large size and the pedicellus already with unicellular glands. The number of pegs on appendages

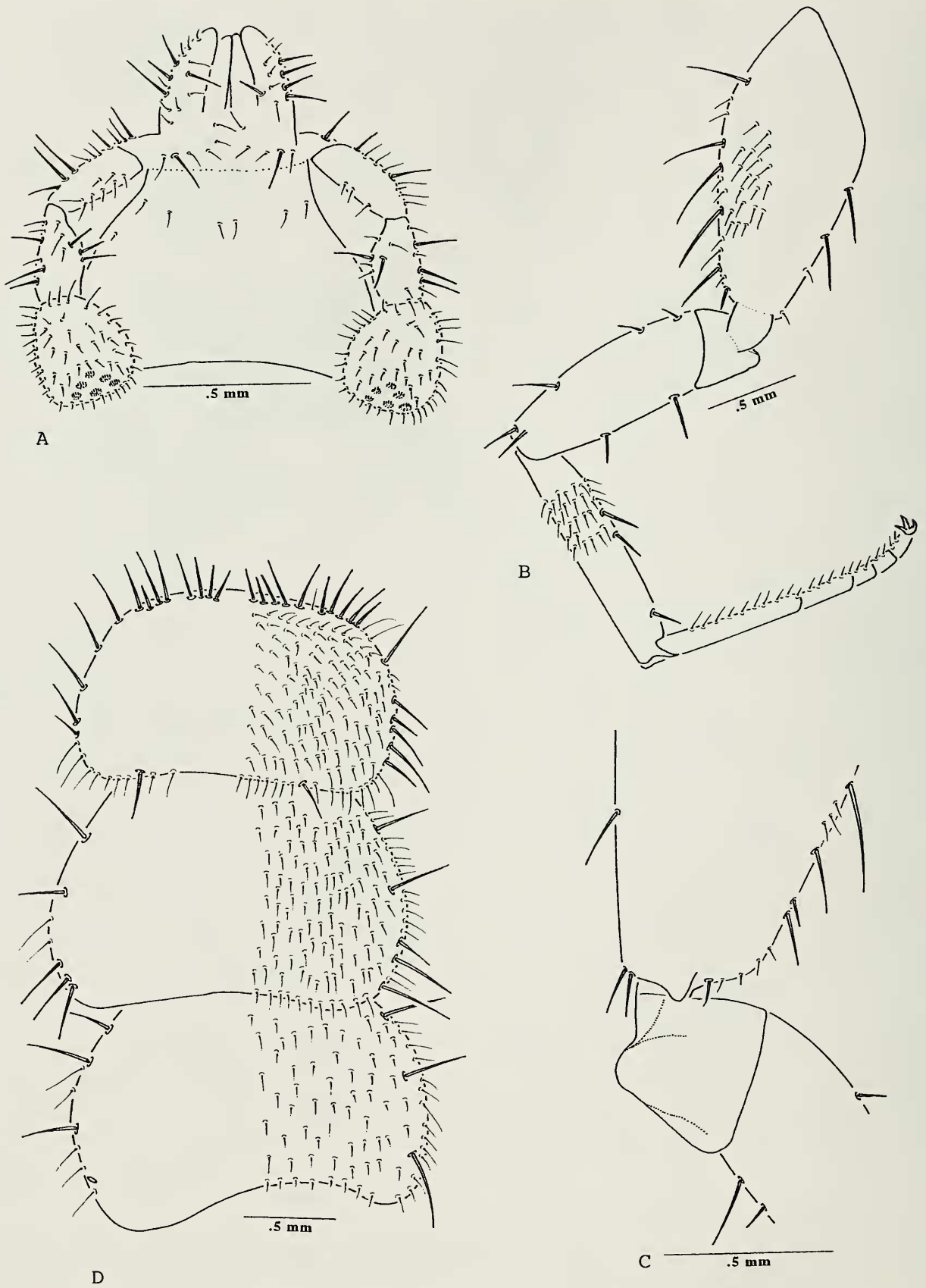


Fig. 2. *Anelpistina puertoricensis*, n. sp.: Adult male holotype; A, Labium; B, Hind leg; C, Hind trochanter; D, Thoracic terga.

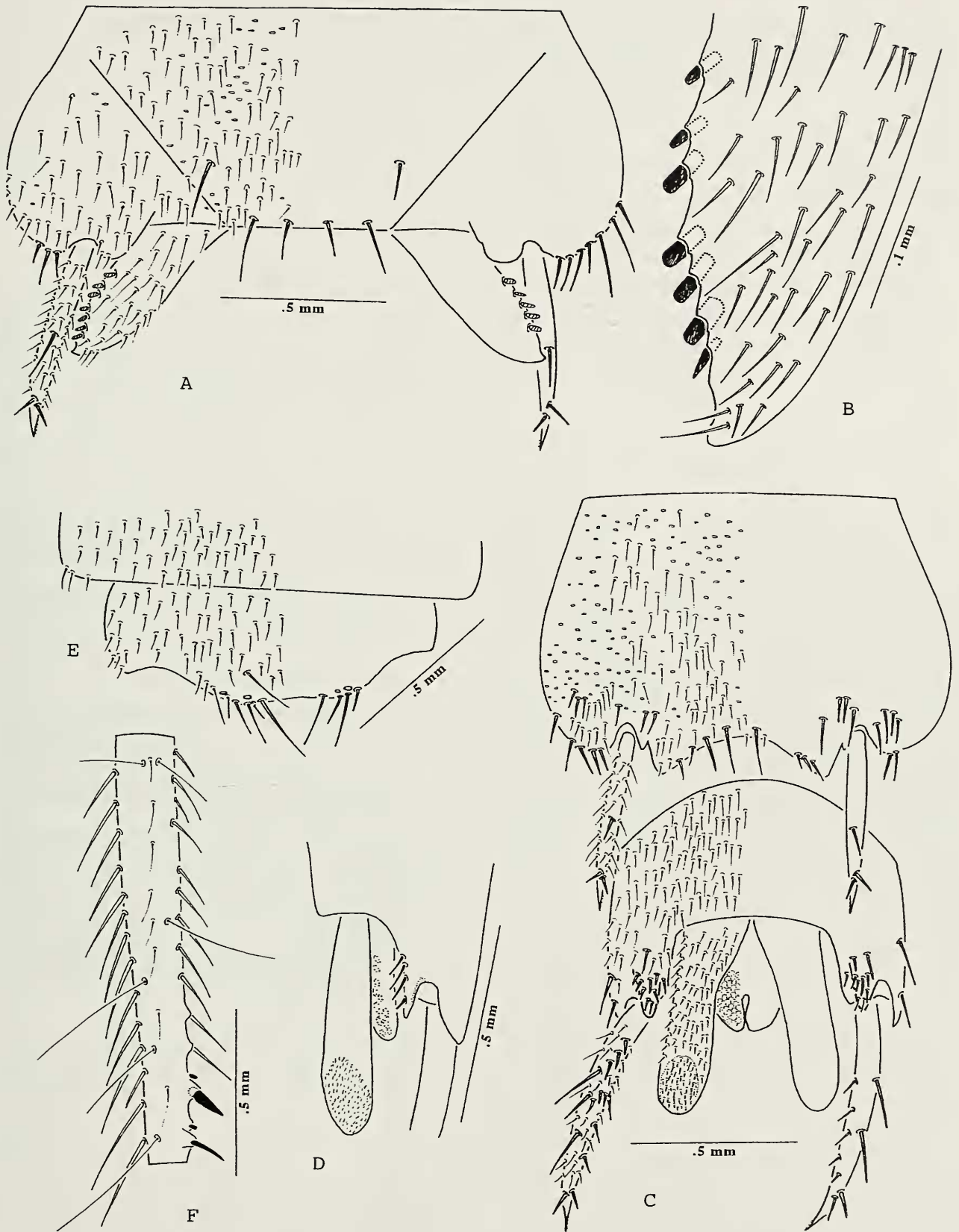


Fig. 3. *Anelpistina puertoricensis*, n. sp.: Adult male holotype; A, Urosternum IV; B, apex of articulated appendage of urosternum IV; C, Urosternum VIII and IX, ventral; D, Urosternum IX, lateral; E, Urosternite X; F, Cercus basal portion.

of urosternum IV are variable, seven on the right side and five on the left. This character may also be variable in the postembryonic development. We could expect a reduced number of pegs in younger instars or higher in older ones. Comparison to other species within the genus indicates that in younger instars, a reduction in or even the absence of secondary sexual characters such as the unicellular glands in the pedicellus, talon in legs, length of appendages of urosternum IV, length of parameres, and spines in cerci may be expected.

Known range.—Known only from the type locality.

Etymology.—In reference to the type locality, the Caribbean island of Puerto Rico.

Remarks.—Adult males of the genus *Anelpistina* can be easily subdivided by the morphology of the appendages of urosternum IV (Fig. 3A). *Anelpistina decui* (Wygodzinsky & Hollinger 1977) and *A. inappendicata* (Espinasa 1999) lack them. In *A. weyrauchi* (Wygodzinsky 1959), the medium-sized appendages have a small subapical projection on outer margin, and two projections on both sides of insertion of stylets. *A. ruckeri* (Silvestri 1905), *A. carriзалensis* (Wygodzinsky 1946), and *A. doradoi* (Espinasa and Baker Alpheis 2001) have simple appendages of very long size, their length being approximately equal to twice the length of urosternum IV and more than 6× longer than wide. Adults of *A. anophthalma* (Bilimek 1867), *A. wheeleri* (Silvestri 1905), *A. miranda* (Silvestri 1912), *A. boneti* (Wygodzinsky 1946), *A. bolivari* (Wygodzinsky 1946), and *A. cuaxilotla* (Espinasa 1999) have simple appendages of medium size, their length being similar to the length of urosternum IV and less than 5× longer than wide, with a small hook on the apex (Figures of Silvestri's description of *A. wheeleri* and *A. miranda* are not clear enough on the presence or absence of the hook). The new species belongs to this last group.

The new species can be differentiated

from all congeners by the presence of pegs in appendages of urosternum IV (Fig. 3B), trochanter with a projection like a talon (Fig. 2C), and the coxal processes of urosternum IX, with the inner projection of the insertion of stylets enlarged and protruding (Fig. 3C).

Acknowledgments

We thank Dr. Randall T. Schuh, curator and chair of the division of Invertebrate Zoology of the American Museum of Natural History, for kindly giving access to the museum collection and facilitating the examination of the specimen. We also thank Stewart B. Peck for the information on the cave locality. Work was done with support of CEAMISH-Universidad Autonoma del Estado de Morelos (UAEM), in facilities of both the CIB-UAEM and the American Museum of Natural History.

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